

**SUMMARY HIGHLIGHTS OF THE TECHNICAL EXCHANGE ON  
U.S. NUCLEAR REGULATORY COMMISSION STAFF EVALUATION OF  
U.S. DEPARTMENT OF ENERGY ANALYSIS MODEL REPORTS,  
PROCESS CONTROLS, AND CORRECTIVE ACTIONS  
MAY 5, 2004**

**Introduction**

On May 5, 2004, staff from the U.S. Nuclear Regulatory Commission (NRC), U.S. Department of Energy (DOE), and DOE's prime contractor, Bechtel SAIC Company, LLC (BSC), convened a technical exchange at the Embassy Suites Conference Center, in Las Vegas, Nevada, to discuss an NRC team evaluation report regarding the quality of certain DOE technical information in three documents that DOE is preparing to support its expected license application for a high level radioactive waste repository at Yucca Mountain, Nevada. The team also evaluated the processes for developing and controlling technical documents and the effectiveness of recent corrective actions.

The detailed agenda for this meeting and the presentation slides used by the NRC staff to present the findings of the April 13, 2004, report, "U.S. Nuclear Regulatory Commission Staff Evaluation of U.S. Department of Energy Analysis Model Reports, Process Controls, and Corrective Actions," can be found in Enclosures 1 and 2, respectively. Video-conferencing was provided to NRC Headquarters in Rockville, Maryland, and to the Center for Nuclear Waste Regulatory Analyses (CNWRA) in San Antonio, Texas. Audio-conferencing was provided to persons in other locations.

In addition to staff from DOE and its contractors, NRC, and the CNWRA, the meeting was attended by representatives from the State of Nevada, the U.S. Nuclear Waste Technical Review Board, Clark, Eureka, Lincoln, and Churchill Counties, as well as Las Vegas print and broadcast media. Enclosure 3 contains the list of attendees.

**Opening Remarks by NRC Staff**

The NRC staff indicated that the purpose of this meeting was to provide an overview of NRC staff's evaluation team findings and answer questions about NRC's independent evaluation activity as it relates to data, software, and models. The evaluation team activities were described as vertical slice audits that evaluated the quality of DOE technical information, DOE's implementation of quality assurance processes, and the effectiveness of DOE's corrective actions. NRC staff stressed that the focus of NRC's attention in evaluating DOE's information was on how DOE is presenting the information, not on whether the NRC staff agreed or disagreed with the information. NRC staff also clarified the NRC's role as an independent regulatory agency to protect public health and safety and the pre-licensing context in which NRC conducted the evaluation.

## **NRC Presentation**

NRC staff explained that the staff's evaluation was consistent with NRC's pre-application role to ensure that a potential license application addresses applicable regulatory issues. NRC staff then described what was expected of DOE in a complete, high-quality License Application, and discussed the origins of NRC's concern with the quality of DOE data, software, and models. NRC staff noted that through this evaluation NRC was able to advance its understanding of quality issues in DOE's program and clarify its expectations of what DOE must provide in the License Application (LA) to comply with NRC requirements.

NRC staff discussed the purpose of NRC's evaluation and the importance of its evaluation findings. NRC staff went on to explain that in order to evaluate the impact of DOE's quality assurance program implementation problems, the NRC audit team examined three Analysis Model Reports in a manner similar to that used by NRC to perform inspections.

The leader of the NRC evaluation team stated that the focus of these audits was to evaluate independently the quality of the technical information in three DOE technical reports in terms of their transparency, traceability, and appropriateness. In addition, he noted that the team evaluated DOE's processes for developing and controlling the quality of technical reports, as well as the effectiveness of recent DOE corrective actions affecting the quality of models, software, and data. He went on to identify the three reports audited as: (a) "General and Localized Corrosion of the Waste Package Outer Barrier," the DOE document that presents how the waste package is expected to perform in storage in order to contain nuclear waste; (b) "Commercial Spent Nuclear Fuel Waste Form Degradation Model," the DOE document that presents how the nuclear fuel that will be stored in the waste package is expected to perform; and (c) "Drift Degradation Analysis," the document where DOE presents how the tunnels containing the waste packages are expected to perform.

The NRC staff explained that the evaluation team found some good practices, noted improvements, and identified concerns with the clarity of DOE's explanations and with sufficiency of technical information used to support DOE's explanations.

Regarding good practices noted by the evaluation team, the team leader cited the excellent cooperation and support from all levels of DOE staff and management the team received throughout the evaluation. In addition, the team leader noted that the technical support for the technical reports was greatly improved over what was available for the Total System Performance Assessment for Site Recommendation; that current technical documents audited were updated, are more comprehensive, and contained more data; and that DOE's Data Qualification Program was effective in identifying some of the existing data concerns in the technical documents.

Regarding the concerns identified by the evaluation team, the team leader noted that the team identified concerns with both clarity of explanation of some of DOE's technical bases presented in the technical reports audited, and also with presentation of adequate technical information necessary to support those explanations. He cited examples where DOE did not explain its technical basis in a way that the team could understand how DOE reached its conclusions. In those instances, because DOE's explanation of its technical basis was not clear, the team was

unable to determine if the associated technical information was sufficient. He also cited examples where DOE did provide a clear explanation of its technical basis but did not provide sufficient technical information necessary to support that explanation. He emphasized that such determinations were based solely on the information presented in the technical reports and supporting references and did not consider: (a) whether the missing information would be available in other DOE documents; (b) whether other activities were underway to collect the missing information; or (c) whether alternative information or approaches could be used to support the technical basis. The team leader also noted that the team found a number of instances where DOE clearly explained its technical basis and also provided the necessary technical information to support the technical basis.

According to the team leader, the team found that the DOE procedures reviewed appeared to be adequate to control the applicable processes. The team leader expressed concern, however, with the degree to which DOE implemented those procedures. Specifically, in his view, the concerns found by the team during this evaluation could reasonably have been identified by a thorough technical review by DOE. Lastly, the team leader reported that NRC's team had confirmed earlier DOE findings that DOE has not succeeded in eliminating recurring problems in the areas of software, data, and models. He noted that DOE recently determined that human performance issues were the primary contributors and that DOE now plans to implement a formal integrated program to improve human performance.

The NRC staff summarized the conclusions of its evaluation as follows:

- The number and similar pattern of concerns found in all three technical reports audited suggest that other technical reports may have similar limitations.
- If DOE continues to use existing policies, procedures, methods, and practices at the same level of implementation and rigor, a potential LA may not contain information sufficient to support some technical positions in the LA.
- While the team did not find that any DOE procedures were inadequate, the concerns identified by the team indicate that the procedures were not fully implemented.
- If not corrected, these concerns could result in a large volume of requests for additional information in some areas, which could extend the review process and prevent NRC from making a decision regarding issuing a construction authorization within the time required by law.

### **DOE Response**

John Arthur, DOE expressed DOE's appreciation for the opportunity to summarize DOE's response to NRC's findings. He stated that DOE takes very seriously the results of NRC's technical evaluation as well as the results of DOE's own quality assurance reviews. He noted that in early April 2004, DOE conducted a review to assess the results of NRC's evaluation to ascertain the extent of the problems and to identify the actions needed to improve overall transparency and traceability of the technical reports that will support the License Application. DOE's review concluded that lack of focused attention on transparency, traceability, completeness, and regulatory perspective were major contributors to the issues identified by

NRC. According to Mr. Arthur, DOE was able to classify 81 of the issues and observations identified by NRC in the evaluation report as follows:

- 43 percent as transparency or traceability issues for which DOE is already taking action to address;
- 28 percent as technical issues that DOE was already working to address;
- 23 percent as positive observations;
- 2 percent as issues concerning drift degradation with which DOE disagrees with NRC staff; and,
- the remaining 4 percent as issues where DOE agrees with NRC staff and no further action is needed.

Mr. Arthur explained that DOE has no questions of NRC staff about the evaluation report. He stated that DOE accepts the major conclusion of the report and agrees that key documents must be reviewed and modified to ensure key requirements are met. He noted that DOE is already taking action to ensure that DOE will submit a high-quality License Application that complies with NRC regulations in December 2004. Mr. Arthur asserted that even before the evaluation report was issued, DOE initiated a comprehensive review of the technical documents that DOE will use to support the LA. He described DOE's Regulatory Integration Team, made up of 150 scientists and regulatory experts, who will participate in the review, due for completion in August 2004.

Mr. Arthur reiterated that DOE has been responsive to the NRC's technical evaluation and has initiated activities that will result in a high-quality LA.

John Mitchell, BSC noted that DOE recently integrated multiple corrective action programs into a single corrective action program and reinforced its self-identification culture to improve the overall performance in improving actions to correct problems.

Joseph Ziegler, DOE thanked the NRC staff for the professional conduct of its audit. In conclusion, he noted that there is a "fuzzy" line between technical evaluation and process evaluation and expressed concern with the importance of making that distinction.

### **Public Comments**

E. von Tiesenhausen, Clark County noted Clark County's decade-long concern with quality assurance in DOE's program. He expressed his view that NRC merely confirmed earlier findings. He also emphasized Clark County's long history of participating as observers in DOE audits and that the County is disturbed that all public participation was excluded from NRC's evaluation. With this in mind, he expressed hope that this was an anomaly but is concerned that it may be a "harbinger of things to come." Bill Reamer (NRC) noted that all three NRC audits were conducted in accord with existing procedures (i.e., "Agreement Between DOE/OCRWM and NRC/NMSS Regarding Prelicensing Interactions," March 26, 1999).

Steven Frishman, State of Nevada also expressed his concern that the exclusion of State and County observers contravenes a longstanding understanding and agreement. He noted that the public only just learned at this meeting anything about how the audits were conducted. He stated Nevada's objection to NRC's new approach, "invented just for this purpose." He suggested that the absence public participation creates the appearance that NRC is "helping" the potential applicant and urged NRC staff to consider if DOE were not another Federal agency, would NRC have conducted these closed audits. Next, Mr. Frishman observed that the public heard for the first time from NRC staff (Fred Brown) about how NRC is trying to treat DOE as a potential applicant rather than as a sister Federal agency. He commented that NRC shouldn't be working to improve DOE's quality, but instead noted that NRC needs "...to improve [its] aura of objectivity" and that "schedule should mean nothing to [NRC]." Mr. Frishman also commented that the report evaluation shouldn't be directed at DOE, but that Congress should be the audience; NRC should report to Congress that NRC sees a problem. NRC staff (Janet Kotra) noted that all members of Nevada's Congressional Delegation, the Attorney General of Nevada, and NRC's Congressional Oversight Committees were provided copies of NRC's evaluation report the day it was issued.

Susan Lynch, State of Nevada observed that the initial notice of the audits said nothing about the "closed" nature of the meetings. She cited the long history of the State's observation of DOE's audits. From her experience, she opined that NRC observers were far "more of a hindrance than any member of the State or local Government ever were." She also expressed her view that "closing the evaluation was the worst thing [NRC] could do for [NRC's] credibility with the public.

Charles Fitzpatrick, Egan & Associates stated that the public doesn't want an uneasy feeling about the relationship between NRC and DOE. He noted that at an earlier public meeting, DOE staff indicated that they were already working on NRC's findings before NRC issued its report. He asked if this meeting was a "sham." Mr. Fitzpatrick directed a hypothetical question to Mr. Arthur -- "If in November, NRC is telling [DOE] the same thing, what will you do? Will you do the right thing and defer [the LA] or will you turn it in any way?" Mr. Arthur responded that DOE won't submit a LA until it has the necessary standard of quality and documentation. He expressed his optimism that DOE can meet the necessary standard of quality. He repeated that DOE will not "go" until the necessary quality is there.

Abby Johnson, Eureka County commented that the original notice didn't say the public was not invited. In a subsequent notice, NRC indicated that NRC was developing a policy for addressing requests from State or local governments to observe such evaluations. She stated that she wanted to be involved in the development of that policy and wanted clarification of confusion created by the nomenclature used in the various NRC meeting announcements ("meeting," "evaluation," "audit," etc.). NRC staff (Bill Reamer) indicated that it would examine the issue and decide how best to get back to her.

Judy Treichel, Nevada Nuclear Waste Task Force indicated her view that NRC staff did need to write a letter. She commented that the evaluations should have taken place in front of the public. Ms. Treichel opined that DOE's poor performance was unchanged since [NRC and DOE] were "separated at birth" -- "they keep doing it." In her view, DOE has not only "not gotten the nuclear culture," recent revelations suggest they didn't "get the mining culture either." She closed stating that, "This is not a competent agency."

### **Closing Remarks**

In closing, Mr. Reamer noted that NRC staff announced as early as July 2003, that persistent concerns about quality that arose when observing DOE's audits of its own program, required direct observation by NRC staff. He noted that DOE staff had indicated that it takes the NRC report seriously, and that it is taking action to address NRC's concerns. He acknowledged criticism from attendees that NRC's evaluations were closed to public observation and that NRC noted the long history of local and State government participation in DOE's audits. He also noted that NRC staff heard that attendees felt that NRC's credibility had been hurt by not opening up the process.

### **Enclosures:**

1. Agenda for the May 5, 2004, Technical Exchange on Analysis Model Reports, Process Controls, and Corrective Actions
2. Presentations for the May 5, 2004, Technical Exchange on Analysis Model Reports, Process Controls, and Corrective Actions
3. Attendee List for the May 5, 2004, Technical Exchange on Analysis Model Reports, Process Controls, and Corrective Actions